

WHAT IS CLAIMED IS:

1. A deck mechanism for a magnetic recording/reproducing apparatus, comprising:
 - 5 a main deckmain deck provided with a head drum and a capstan motor;
 - a sub-deck installed on the main deckmain deck to be loaded/unloaded, the sub-deck being provided with a pair of reel discs, onto which tape reels of a tape cassette are seated, respectively;
 - 10 a pole base loading unit for taking out and guiding a tape to be in contact with a side of the head drum when the sub-deck is loaded;
 - a pinch roller unit for compressing the tape against a spindle of the capstan motor when the sub-deck is loaded;
 - 15 a brake unit for selectively braking one of the reel discs;
 - a main sliding member mounted on the main deckmain deck to be capable of reciprocatingly sliding, the main sliding member controlling the driving of the pinch roller unit; and
 - 20 a main cam gear mounted on the main deckmain deck to be capable of rotating, the main cam gear allowing all of the sub-deck, the pole base loading unit, the brake unit, and the main sliding member to perform linked movements while the main cam gear is rotationally driven.
2. The deck mechanism according to claim 1, wherein the pole base loading unit comprises:
 - 25 a pair of pole base assemblies mounted to be capable of reciprocating on the main deckmain deck, the pole base assemblies moving the tape as being loaded to come into contact with the head drum;
 - a guide rail provided on the main deck, for guiding the movement of the pole base assemblies;
 - 30 a pair of loading gears mounted on the guide rail to be capable of being rotated, the loading gears being engaged with each other and connected to the main cam gear; and
 - a pair of link units for linking the loading gears to the pole base assemblies,

respectively.

3. The deck mechanism according to claim 2, wherein at least one of the loading gears is integrally formed with a hook so that the at least one loading gear is
5 directly joined to the guide rail.

4. The deck mechanism according to claim 2, wherein the loading gears comprise:

a first loading gear fitted on the bottom side of the guide rail to be capable of
10 being rotated; and

a second loading gear fitted on the guide rail and provided with a small gear section engaged with the first loading gear and a large gear section connected to the main cam gear.

15 5. The deck mechanism according to claim 4, wherein the large gear section is formed in a position lower than the small gear section, so that a step is formed therebetween, and the large gear section has a radius larger than that of the small gear section.

20 6. The deck mechanism according to claim 4, wherein the large gear section is provided in such a manner that gear teeth are projected only from a predetermined area on the circumference of the second loading gear, whereby the large gear section is engaged with the main cam gear only in the predetermined area.

25 7. The deck mechanism according to claim 6, wherein a pair of large gear valleys, which are relatively deep as compared to the neighboring gear valleys, are formed in the large gear section, the large gear valleys respectively positioned at the opposite ends of the larger gear section, respectively, to start engagement with the main cam gear according to the rotating directions of the main cam gear, and a pair of large
30 teeth, which are relatively highly projected as compared to neighboring gear teeth, are formed in the main cam gear, the large gear teeth positioned to correspond to the large gear valleys.

8. The deck mechanism according to claim 7, wherein the large gear teeth are formed in a position lower than the other gear teeth formed all over the circumference of the main cam gear.

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9. The deck mechanism according to claim 6, wherein the main cam gear comprises:

a main gear part formed all over the circumference to receive power;

10 a connection gear part formed in a position lower than the main gear part to be connected with the gear teeth of the large gear section;

a pair of large gear teeth respectively formed in the leading and trailing parts of the connection gear part to be larger than the gear teeth of the connection gear part; and

15 a sliding wing portion formed to be projected in a circular arc shape of a predetermined length in a place laid out from the connection gear part and the large gear teeth and lower than the main gear part, the sliding wing portion slidably contacted with the circumference of the large gear section.

10. The deck mechanism according to claim 1, wherein the pinch roller unit 20 comprises:

a pivot lever rotatably mounted on the main deckmain deck and rotated toward the spindle of the capstan motor in cooperation with the sub-deck as being loaded;

25 a pinch roller rotatably mounted on one end of the pivot lever and coming into close contact with the spindle of the capstan motor; and

a torsion spring mounted on the pivot lever, the torsion spring being pushed and compressed by the sliding member, thereby urging the pivot lever firstly pushed by the sub-deck against the spindle of the capstan motor.

30 11. The deck mechanism according to claim 10, wherein one end of the torsion spring is downwardly bent toward the main sliding member side, and a compression projection is upwardly projected from the main sliding member to come

into contact with and compress the one end of the torsion spring.

12. The deck mechanism according to claim 10, wherein, when the torsion spring is loaded along with the pivot lever, the main sliding member is reciprocated for 5 a predetermined distance one time so that it does not interfere with the movement of the torsion spring.

13. The deck mechanism according to claim 11, wherein, when the loading of the torsion spring is completed, one end of the torsion spring is positioned in the 10 moving area of the compression projection, so that the torsion spring is capable of being contacted with and compressed by the compression projection when the main sliding member moves.

14. The deck mechanism according to claim 14, wherein the main cam gear 15 is formed with a main cam slot in a predetermined length and shape, the main cam slot allowing the main sliding member to be linked thereby controlling the reciprocation movements of the main sliding member.

15. The deck mechanism according to claim 14, wherein the main cam slot is 20 formed on the bottom surface of the main cam gear.

16. The deck mechanism according to claim 1, wherein the brake unit comprises:

a first brake pivotally installed on the sub-deck, the first brake being 25 contacted with and spaced from the one reel disc;

a spring for compressing the first brake to be contacted with the one reel disc;

a second brake installed coaxial to the first brake, the second brake being rotated with the first brake in one direction, in which the first brake is spaced from the one reel disc, and being independently rotated in the other direction opposite to the one 30 direction to come into contact with the one reel disc; and

a torsion spring for compressing the second brake to be contacted with the one reel disc, wherein each of the first and second brakes is selectively contacted and

linked with the main cam gear when the sub-deck is loaded, thereby being separated from/contacted with the one reel disc.

17. The deck mechanism according to claim 16, wherein the first and second
5 brakes are formed with first and second guide pins projected from the bottom sides thereof, respectively, the first and second guide pins being contacted with and guided by the main cam gear.

18. The deck mechanism according to claim 17, wherein the main cam gear
10 is provided with a guide slot for sequentially guiding the first and second guide pins in a predetermined area in the rotational direction of the main cam gear.

19. The deck mechanism according to claim 18, wherein the guide slot is formed in the predetermined area on the top surface of the main cam gear, and the first
15 and second guide pins are sequentially entered in and spaced from the guide slot at the time of loading/unloading the first and second guide pins, thereby being selectively guided.

20. The deck mechanism according to claim 16, wherein the one reel disc is
20 the supply side reel disk that is adjacent to the main cam gear.

21. The deck mechanism according to claim 1, further comprising a reel cover installed on the top side of the sub-deck, for supporting the brake unit.

25 22. The deck mechanism according to claim 1, wherein the sub-deck is formed with a cam slot in a predetermined shape and the cam slot is capable of cooperating with and moving a projection pin projected from the main cam gear at the time that loads/unloads the main cam gear.

30 23. The deck mechanism according to claim 1, further comprising a mode switch for sensing various operation modes including the loading/unloading of the sub-deck, the mode switch being adapted to cooperate with the main cam gear.

24. The deck mechanism according to claim 23, wherein the mode switch comprises:

an elastic brush installed under the main cam gear and provided with a
5 plurality of contact pins; and

an FPC provided with a mode-sensing pattern in a predetermined shape, in
which the elastic brush is contacted with the mode-sensing pattern and the FPC faces
the bottom surface of the cam gear.

10 25. The deck mechanism according to claim 24, wherein the bottom surface
of the main cam gear is provided with an accommodation recess for accommodating
and supporting the elastic brush.

26. The deck mechanism according to claim 1, wherein the main cam gear
15 comprises:

a disc-shaped body rotatably installed on the top surface of the main
deckmain deck;

gear teeth formed on the circumference of the body in a predetermined shape
to cooperate with the pole base loading unit;

20 a cam slot formed on the bottom surface of the body and cooperating with the
main sliding member to reciprocate the main sliding member;

a guide slot formed on the top surface of the body and cooperating with the
brake unit to drive the brake unit; and

25 a projection pin projected from the top surface of the body and cooperating
with the sub-deck to load/unload the sub-deck.